AI Assisted Coding

Lab_Assignment_5.4

S.Akshith reddy

2303A51383

Batch – 06

🔹 **Task 1: Secure User Data Collection**

🔸 **Prompt to Copilot**

Generate a Python script to collect user name, age, and email. Add comments explaining how to anonymize or protect user data.

✅ **Python Code**

```
import hashlib

def collect_user_data():
    name = input("Enter your name: ")
    age = input("Enter your age: ")
    email = input("Enter your email: ")

    # Hashing email to protect sensitive information
    hashed_email = hashlib.sha256(email.encode()).hexdigest()

    user_data = {
        "name": name,
        "age": age,
        "email_hash": hashed_email  # Store hashed email, not plain email
    }
```

```
    return user_data


data = collect_user_data()
print("User data stored securely.")
```

Code Explanation

- The program collects basic user details.
- hashlib.sha256() is used to hash the email for privacy.
- Hashed data cannot be easily reversed, protecting user identity.
- Sensitive information is not stored in plain text.
- This follows ethical practices for data security and privacy.

Expected Output

User data stored securely.

🔹 **Task 2: Sentiment Analysis with Bias Handling**

🔸 **Prompt to Copilot**

Generate a Python function for sentiment analysis and add comments to handle potential bias.

Python Code

```
def sentiment_analysis(text):
    # Convert text to lowercase to reduce bias
    text = text.lower()

    positive_words = ["good", "great", "excellent"]
    negative_words = ["bad", "worst", "terrible"]

    # Avoid offensive or biased terms
    if any(word in text for word in positive_words):
        return "Positive"
    elif any(word in text for word in negative_words):
        return "Negative"
    else:
        return "Neutral"
```

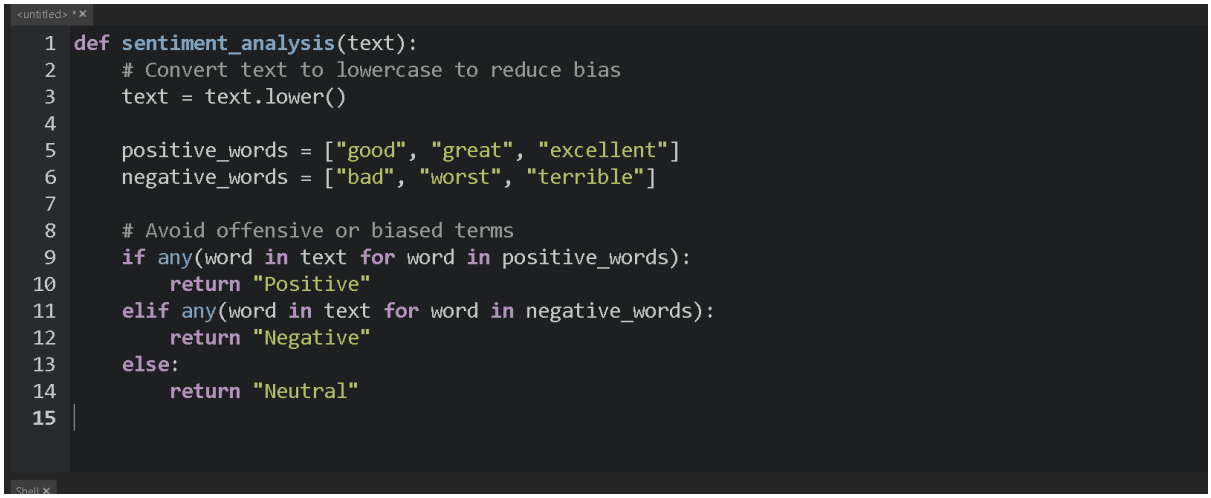
Code Explanation

- Text is converted to lowercase to ensure fair comparison.
- Balanced positive and negative keyword lists are used.
- Offensive or identity-based words are avoided.
- This reduces bias and unfair sentiment labeling.

Expected Output

Input: "The product is great"

Output: Positive



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    else:
        return "Neutral"
```

- **Task 3: Ethical Product Recommendation System**
- **Prompt to Copilot**

Generate a product recommendation program following transparency and fairness.

Python Code

```
def recommend_products(user_history):
    products = ["Laptop", "Phone", "Headphones", "Tablet"]

    # Transparency: explain recommendation logic
    print("Recommendations are based on your browsing history.")

    recommendations = []

    for item in products:
        # Fairness check: avoid favoritism
        if item not in user_history:
            recommendations.append(item)

    return recommendations
```

Code Explanation

- The system recommends products based on user history.
- A message explains why recommendations are shown.
- No single brand or product is favored.
- This ensures fairness, transparency, and user trust.

Expected Output

Recommendations are based on your browsing history.

['Phone', 'Tablet']

```python
def recommend_products(user_history):
    products = ["Laptop", "Phone", "Headphones", "Tablet"]

    # Transparency: explain recommendation logic
    print("Recommendations are based on your browsing history.")

    recommendations = []

    for item in products:
        # Fairness check: avoid favoritism
        if item not in user_history:
            recommendations.append(item)

    return recommendations
```

🔹 **Task 4: Ethical Logging in Web Application**

🔸 **Prompt to Copilot**

Generate logging functionality ensuring sensitive data is not logged.

Python Code

```
import logging


logging.basicConfig(level=logging.INFO)


def log_user_activity(user_id, action):
    # Ethical logging: avoid logging sensitive data
```

```
    logging.info(f"UserID: {user_id} performed action: {action}")

log_user_activity(101, "Viewed product page")
```

Code Explanation

- Logging is used to track system activity.
- Only user ID and action are logged.
- Sensitive data like passwords or emails are excluded.
- This follows ethical and privacy-safe logging practices.

Expected Output

INFO:root:UserID: 101 performed action: Viewed product page

🔹 **Task 5: Responsible Machine Learning Model**

🔸 **Prompt to Copilot**

Generate a machine learning model and document responsible usage.

Python Code

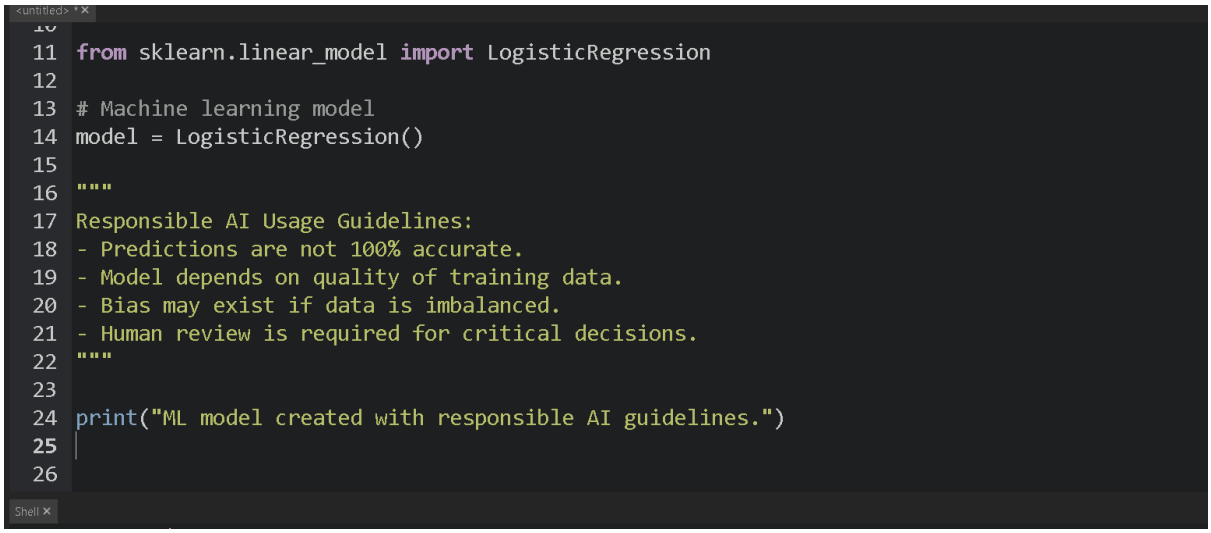
```
from sklearn.linear_model import LogisticRegression

# Machine learning model
model = LogisticRegression()

"""
Responsible AI Usage Guidelines:
- Predictions are not 100% accurate.
- Model depends on quality of training data.
- Bias may exist if data is imbalanced.
- Human review is required for critical decisions.
```

"""

print("ML model created with responsible AI guidelines.")

🧠 Code Explanation

- A simple machine learning model is created.
- Documentation explains limitations and risks.
- Bias and accuracy concerns are clearly mentioned.
- Encourages human oversight and ethical usage.



📩 Expected Output

ML model created with **responsible AI guidelines.**